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ABSTRACT

Project Flagship, the 1974 Distinguished Achievement Awards entry from State University College at Buffalo, New York, is a competency-based teacher education model using laboratory instruction. The special features of this model include a) stated objectives and criteria for evaluation, b) individualized instruction, c) individualized learning rates, d) laboratory instruction, and e) remediation. The following delivery systems are used to establish these features; a) a sequence of 10-minute video tapes; b) a 20-minute, narrated, 2x2 slide series; c) a self-instructional manual; d) scheduled live demonstrations; and e) scheduled lectures. Students have the option of using one or any combination of delivery systems. Evaluation of the project is achieved through pre- and post-assessment scores from two groups of students. The experimental group experiences Project Flagship while the control group has assigned courses and textbooks. Results reveal higher overall scores for the experimental group on preassessment tests. On postassessment tests, data show higher scores on psychomotor competencies for the experimental group. (The report presents graphs and modules.) (BRB)

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ABSTRACT/INFORMATION FORM - 1974 DAA PROGRAM

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The implications for a CBTE model for laboratory type instruction has significant implications for all programs having laboratory type instruction. Teacher education and general liberal curricula involved with laboratory courses may profit from a flexible design which has application for college programs as well as the secondary level. Each involves a need for cognitive and psychomotor evaluation with unique and personalized support systems. Project Flagship may be a model which will allow traditional programs to convert to CBTE.

Recent developments in CBTE have been directed toward the professional sequence. Laboratory type instruction has received less attention as teacher education programs adapt CBTE, even though laboratory type instruction courses are a substantial aspect of all teacher education programs. A developmental design for laboratory courses implementing CBTE is a necessary corollary to the professional sequence. It is difficult to develop a working relationship between the professional sequence and laboratory courses when one employs the use of CBTE at the exclusion of the other. The Industrial Arts faculty at State University College at Buffalo decided that an experimental CBTE program was necessary to provide an orderly adaptation of CBTE which would include the professional sequence and laboratory courses. Two sections of basic graphic arts were used to test CBTE in laboratory type instruction.

Project Flagship was designed to include the following features: stated objectives and criteria evaluation, self-paced, directed toward individual learning styles, support systems unique to the laboratory program, and a remediation system. Fundamental laboratory abilities were gained through self-pacing high impact processes. In order to successfully execute this strategy, the following delivery systems were developed: a sequence of video tapes of an average ten minute duration; narrated 2 x 2 slide series of an average twenty minute duration; self-instructional manual; scheduled live demonstrations; and scheduled lectures. The student had the option of using one or any combination of delivery systems.

SP 007 545

Program Description

The Board of Regents in New York State have stated as a goal the preparation of the professional teacher as follows:

> "To establish a system of certification by which the state can provide assurance to the public that professional personnel in the public schools possess and maintain demonstrated competence to enable children to learn."

Implementing the Regent's goal into a functional program of certification based upon a competency based teacher education program, required that evaluation of the cognitive and psychomotor domain be an integral function of the process. Establishing effective criteria for evaluating psychomotor and cognitive skills required acceptance of the premise that there are measurable levels of minimum competence and performance for a particular program.

Competency Based Teacher Education Programs have as a goal identification and evaluation of minimum levels of competence and performance which are stated and known by the student and instructor. This information is introduced during the initial stages of the program and adhered to until the student concludes the program. CBTE programs require extensive use of support systems. Generally, these systems are adaptations of support systems used in a traditional program, modified for CBTE programs.

Early developments in CBTE programs were confined to the professional sequence. Subject matter areas, and particularly laboratory type instruction courses have received far less attention as teacher education programs implemented CBTE, even though laboratory subject areas are a substantial portion of all teacher education programs. A developmental design for laboratory courses implementing CBTE programs is a necessary corollary to CBTE programs for the professional sequence. It is difficult to develop a close working relationship between a CBTE professional sequence on the one hand and laboratory course work on the other. The Industrial Arts

Education faculty at State University College decided that an experimental CBTE program Project Flagship was necessary to provide an orderly transition into a CBTE program as the professional sequence developed its own unique CBTE curriculum.

Personnel involved with Project Flagship in the Division of Industrial Arts Education realized that effective and efficient delivery systems must be unique to the laboratory converting to CBTE. The delivery system must be designed to meet the unique and specific needs of any course which is modified for conversion to CBTE. The delivery system developed for Project Flagship utilized the following features: high impact, short duration, adaptable to individual learning styles, and available upon demand. This design was for the performance competency; however, lectures, demonstrations, bibliographies, and reserved reading material at the library provided the delivery system for cognitive competencies.

Objectives

Project Flagship, developed for the basic Graphic Arts course, established the following objectives:

1. The student is held responsible for acquisition of the basic concepts necessary to complete the criteria for each mini module.

2. The instructor is held accountable for developing and implementing delivery systems to satisfy the unique needs of students completing the minimum criteria for each mini module.

3. The rate of progress for students is based upon the individual's decision of readiness to complete the mini module.

4. Selection and implementation of the various delivery systems are designed to satisfy the unique learning style of the individual.

5. The student is able to elect experiences which exceed minimum levels of competence stated for each mini module.

6. Evaluation of student progress is open and may be reviewed by students at any time.

The development of Project Flagship for laboratory courses has significant implications for all laboratory oriented programs in teacher education and the general liberal curriculum. As teacher education programs introduce CBTE programs into the various disciplines, a design model is necessary which is applicable for the college, high schools, and junior high schools. This problem is resolved when teachers in the field have a flexible program model to refer to as described in this study.

Limitations

Project Flagship was limited to students enrolled in the basic Graphic Arts in the Division of Industrial Arts Education. The basic Graphic Arts course is required of all Industrial Arts majors. Two sections were offered, establishing an experimental and control group. Students were in their sophomore and junior years. Evaluation of Project Flagship covered a seven week period, during which all materials completed one cycle in an actual laboratory situation.

Program Development

Course content for Project Flagship was developed from a model flow chart of a typical graphic arts industry. A comprehensive course outline included every aspect of a typical graphic arts industry. The flow chart and outline provided the base for developing CBTE modules, the modules were divided into mini modules with comparison competencies in the cognitive and psychomotor domain. The various delivery systems were developed to support the objectives and competencies stated in the mini module. The delivery systems were used for completing the psychomotor/

cognitive competencies; however, the cognitive competencies were evaluated with a series of multiple choice tests.

The mini modules were designed to include the following: rationale, prerequisite, pre-assessment level, objectives, delivery systems, post-assessment level, remediation, time requirement, and grade options.

The rationale introduced students to the mini module. It explained why students were expected to have specific competencies and the significance of each to the Graphic Arts program.

Prerequisites were necessary when special materials or information was required in order to successfully complete the mini module at the stated criterian level. Students were not allowed to undertake any mini module until all prerequisites were satisfied.

Pre-assessment was a comprehensive multiple choice question test. The pre-assessment was administered at the beginning of the course. The test was divided into sections, one for each mini module, however, students scoring 100% for any one section were excused from all activities associated with the cognitive competencies for that mini module. Students were expected to satisfy the psychomotor competencies for the mini module regardless of the pre-assessment score.

Objectives for each mini module were designed to detail expectations of performance for each student. The criteria used to evaluate the work was detailed and listed for reference by students.

A post-assessment was designed to evaluate the cognitive competencies of students not scoring 100% on the pre-assessment test. A score of 100% was required for the post-assessment test (a multiple choice test). Each student was to use one or any combination of delivery systems to prepare for a multiple choice post-assessment test. The post-test evaluated student understanding of the concepts and principles required to successfully complete the psychomotor skills.

The delivery systems were unique to Project Flagship. Each was designed for high impact, short duration, and for use upon demand. Included within this package of support materials were the following:

1. Self-instructional laboratory manual which included lecture outlines, mini module objectives, criteria levels of competency for the psychomotor and cognitive skills, and pictorial sequence of the procedures necessary to complete the mini module.

2. Programmed series of narrated 2 X 2 slides of the procedures necessary to complete the procedures for the psychomotor skills.

3. Video tape presentation of ten minute duration (average time) of the procedures for each mini module.

4. Lecture and lecture-demonstrations given by the instructor to provide students with a more personalized presentation. This delivery system was designed for students who have difficulty adapting to a systems approach for obtaining the necessary information to complete the objectives of the mini module.

5. A bibliography designed for Project Flagship listed specific textbooks in the library for each module and mini module.

Remediation was directed at individuals not scoring at the 100% level on the post-test. The previously described delivery systems were used in the remediation process; however, individualized help from the instructor was available. Assistance on a one to one basis proved beneficial, since the impersonal aspect of a systems approach was circumvented.

Grade options beyond the minimum criteria levels were available. Students had two options. They could elect the options stated in the mini module objective, or develop one of their own which satisfied the criterian level. Grade options were either A or B. Each had increasingly

more difficult levels of psychomotor and cognitive skills. Students did not receive a grade lower than the one contracted; however, failure to meet the minimum criteria necessitated selecting a grade option of less difficulty. Decisions regarding grade options were at the discretion of the student involved.

The preceding design model was used for every mini module developed for the Project Flagship. The program model had the following features:

1. The student is responsible for acquisition of the basic concepts for each mini module.

2. The rate of progress is the decision of the student, based upon his understanding of his readiness to progress.

3. The use of several delivery systems unique to Project Flagship is designed to provide students with resources to develop their individual learning styles.

4. The selection and implementation of one or any combination of delivery systems is the prerogative of the student; however, each was accessible upon demand.

5. Students are provided with option which enable them to exceed the minimum criterian objective, thus contracting for and obtaining a higher grade for a specific mini module.

6. All grading and evaluation is public and available upon demand. Students are aware of their progress through the program.

7. Students were able to develop their individual time schedule for completing the objectives of the mini module.

Data

To evaluate the effectiveness of Project Flagship, two sections were used, one a control group and the other as the experimental group. Evaluation of the cognitive level of the experimental group was with

the first test scores for each mini module. Students in the experimental group were required to score at the 100% level, therefore, only the first test scores could be considered.

Evaluation of each group began with a pre-assessment test. Scores were plotted on a normal curve. As expected, students in both groups scored low with similar profiles. Scores on tests which could be compared indicated that the experimental group scored higher than the control group. This was a consistent characteristic for all tests. The individual results were plotted on the curve as a group score. The experimental group had a slightly higher overall test average. While students in the experimental group did not have an assigned course textbook, they consistently scored higher than the control group which had an assigned and required textbook. The use of several delivery systems, individual help, and open laboratory time provided students in the experimental group with several alternatives for obtaining the necessary information. Students were receptive to the use of such methods. Students in the control group were not exposed to such systems.

The post-assessment for each group revealed that both had increases in test scores. This was an expected outcome; however, the respective curves revealed that the experimental group had a negatively skewed curve while the control group a positively skewed curve.

The psychomotor competencies revealed the greatest difference between groups. Although each group was evaluated with criteria established for its respective course, observation and evaluation of laboratory work indicated the experimental group achieved at a higher level than the control group. When the two groups were compared against their respective criteria, the experimental group consistently scored higher. This could be explained

by the fact that students in the experimental group were aware of the criteria for each mini module and planned their activities accordingly. Students enrolled in the experimental class gave a positive assessment of the program. Many of the favorable comments were directed toward advance knowledge of all objectives for each mini module and the use of an open laboratory to provide students with free access to the facilities and the instructor for individual help.

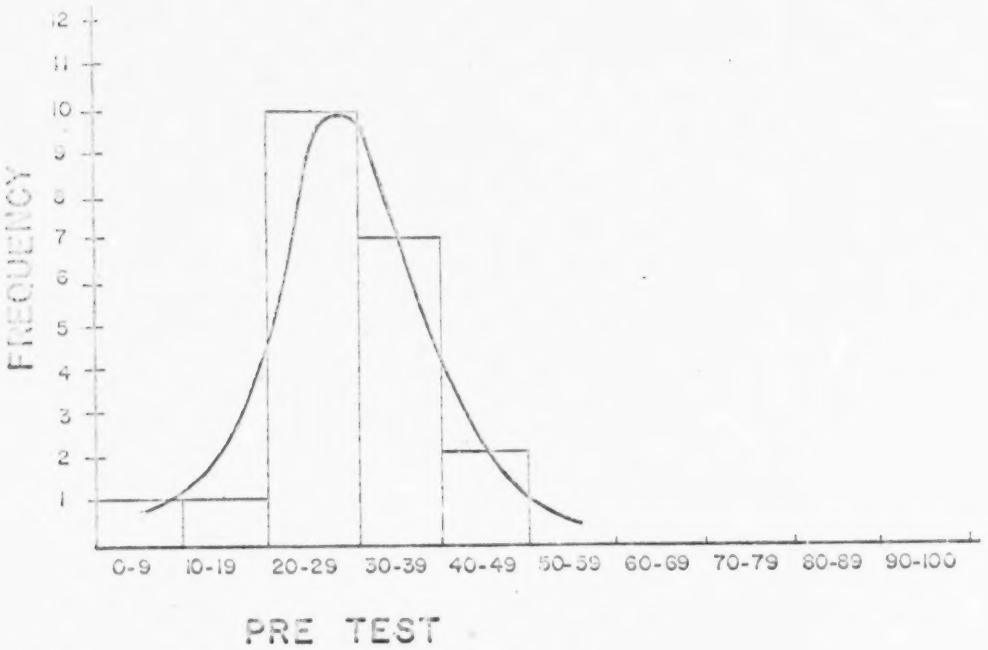
Project Flagship was developed by the faculty of Industrial Arts Education as a model in a CBTE program in laboratory type instruction. The Industrial Arts faculty at State University College at Buffalo decided that an experimental CBTE program was necessary to provide an orderly transformation to CBTE which includes the professional sequence and laboratory content.

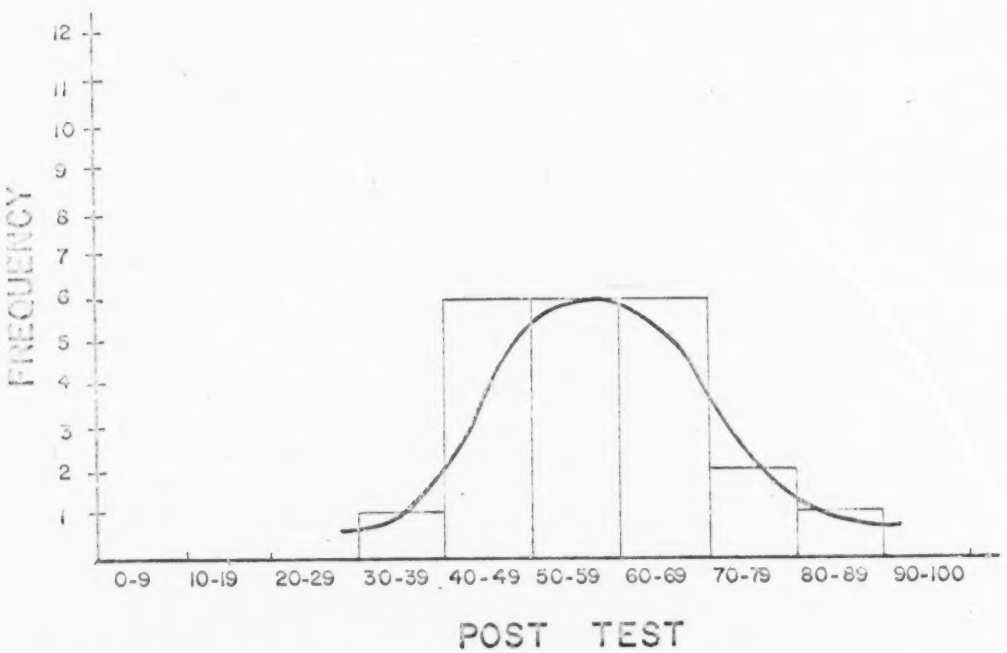
This CBTE model has significant implication for all programs having laboratory type instruction such as Science, Industrial Arts, and Home Economics.

The significance of a CBTE model for college level laboratory courses free of rigorous restrictions and adaptable to a variety of laboratory situations becomes more evident as the demand for expansion of the CBTE into the high school and junior high schools becomes more pronounced. Educators will require a design model for laboratory courses applicable to numerous situations.

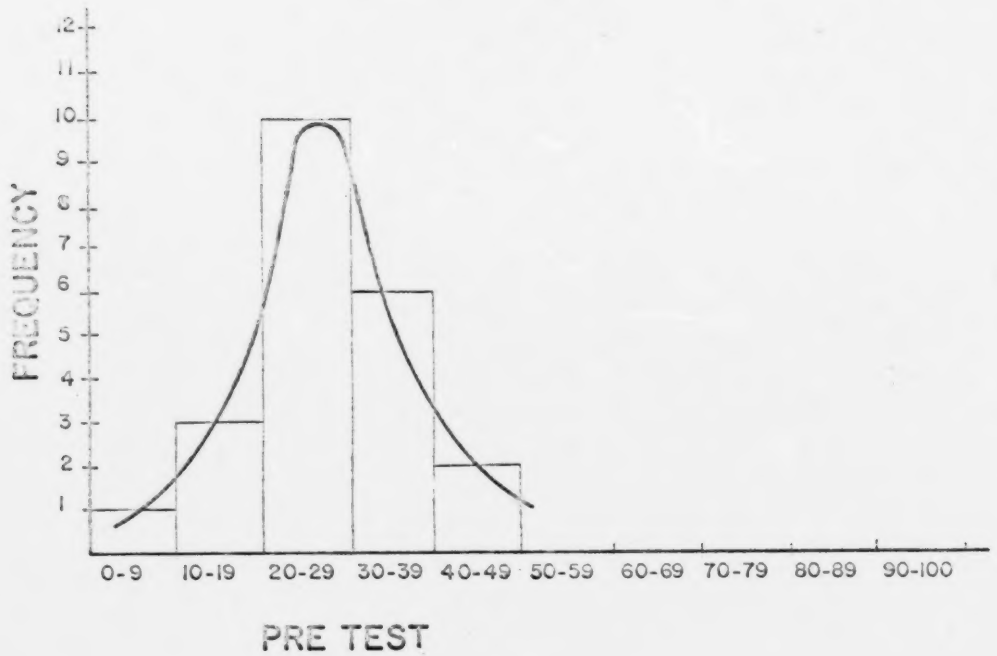
The development and measurement of competencies in the cognitive and psychomotor domain have been facilitated by features in Project Flagship. Such programs require strategies in laboratory fundamentals and abilities which are gained through self-paced and high impact processes, for which Project Flagship is an example.

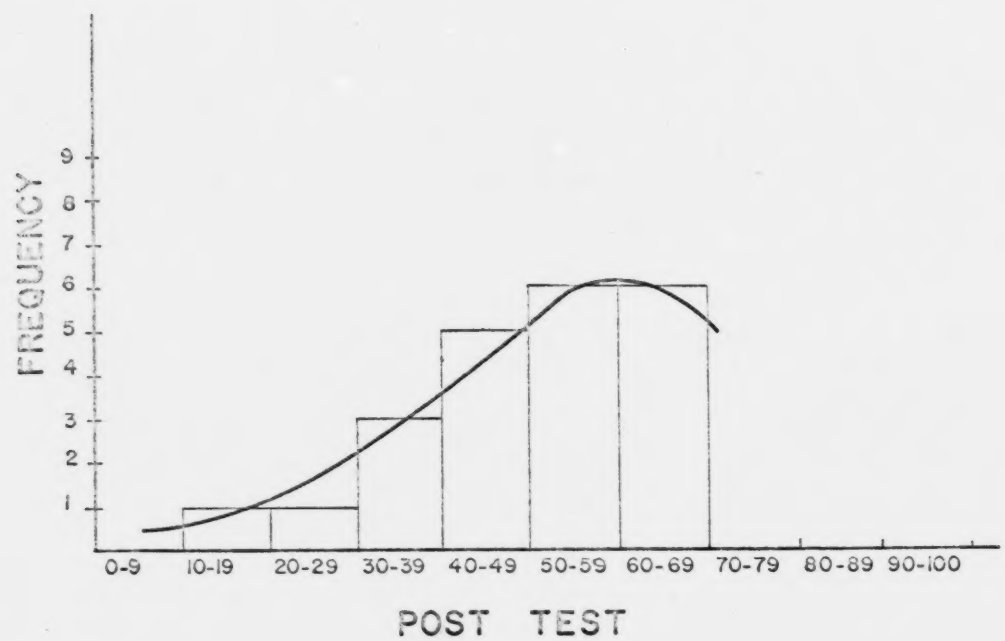
Experimental Group





Control Group





Cluster: Communications and Power

Course: Graphic Arts

Module: Layout and Design

- Mini Module: Photographic Negative
- Mini Module: Contact Print
- Mini Module: Typography
- Mini Module: Layout

Module: Composition

- Mini Module: Handset Composition

Module: Process Camera

- Mini Module: Halftone Negative - Contact Method

Module: Platemaking

- Mini Module: Halftone Photoengraving
- Mini Module: Duplicate Plates

Module: Press Operation

- Mini Module: Platen Press - Semi Automatic

Module: Finishing Operation

- Mini Module: Thermography, Cornering, and Hot Stamp

Module: Binding

- Mini Module: Soft Cover - Stitching and Perfect Binding
- Mini Module: Hard Cover - Edition and Perfect Binding

III. Layout and Design

A. Photography

1. types of cameras

a. viewing systems

b. focusing systems

2. camera lens

a. types of lens

b. purpose of each

c. lens control

3. film

a. basic types

b. reciprocity

c. definition

d. film speeds

e. characteristic curve

4. darkroom procedures

a. handling and loading film

b. contact prints

c. enlarging

B. Typography,

1. type design

a. factors to consider

1) width

2) weight

3) serif

4) contrast

5) decoration

b. tyographic elements

1) counter

2) ascender

3) descender

4) light elements

5) heavy elements

6) bowl

7) bar

2. Classification of type

a. serif

1) san serif

2) wedge

3) bracketed

4) barbed

5) unbracketed

6) sheared

b. race (groups)

1) Roman

(a) oldstyle

(b) modern

2) Gothic

3) Slab Serif

4) Script

5) Text

6) Novelty

c. family

d. series

3. typographic fonts

a. distributior of type

b. distribution of letters

1) letter usage

2) average use of the letters "e" or "a"

4. display and body type

a. display type

1) 14-144 points

2) common usage

(a) attention getting type size

(b) information not a primarly function

b. body type

1) 4-14 points

2) common usage

(a) information primary function

(b) expands the idea presented by display type

5. harmony of type styles

a. compatibility of type styles

b. use of select display and body types

c. general considerations used for harmony of type

1) sameness of type styles

2) the closer the serif and face styles the more compatible

3) less style similarity, less harmony of type

C. Art work

1. camera reproduction classification

a. line copy

b. continuous tone copy

2. common art work renderings

a. pencil drawings

b. ink renderings

c. wash renderings

1) dry wash

2) wet wash

d. airbrush

e. charcoal

f. pastels

g. water colors

h. oil paintings

i. miscellaneous

1) scratchboard

2) coquillboard

3) screen and art types

D. Principles of layout and design

1. rules of layout

a. proportion

b. balance

c. contrast

d. harmony

e. rhythm

f. unity

2. basic elements for layout

a. typography

b. photography

c. art work

3. development of layout

a. visualization

b. commonly used symbols

c. sketching procedures

1) types of sketches

2) sketching symbols

4. copyfitting

a. considerations

1) body type

2) display type

3) illustrations

b. procedures

1) character count

2) word count

3) square inch method

4) unity count

Module: Layout and Design
Mini Module: Photographic Negative

I. Rationale:

This mini module introduces the student to the basic concepts of an adjustable camera, working with photographically sensitive materials, using a three step gray scale for negative evaluation, the procedures for producing a technically acceptable continuous tone ngeative and a method for evaluating the negative. The concepts involved with this module are used consistently throughout the graphic arts program and will be referred to for many related procedures in succeeding processess. Techniques, procedures, and methods of evaluation developed and introduced during this procedure will be used frequently.

II. Prerequisite

None

III. Pre-assessment

A written test administered previously with the section concerned with photographic negatives will serve as the pre-assessment test. Students scoring 100% are not required to participate in the related activities for this mini module; however, all students are expected to satisfy the criteria for obtaining a technically acceptable continuous tone portrait negative.

IV. Objective

The student is to produce a technically acceptable continuous tone portrait negative. The student when give an adjustable camera, film, light meter, two photoflood lamps, a subject with gray scale, processing facilities, and equipment, will produce a technically acceptable continuous tone portrait negative. The continuous tone negative will be evaluated within the following criteria:

1. Sharpness of the image
2. Density range of the negative is 1.50±.10
3. Contrast index of the negative is .65
4. Highlight density .15±10; Shadow density 1.60±.10
5. Light ratio of 1:2, 1:3, or 1:4

V. Delivery Systems

The student is encouraged to use all or any one of the following delivery systems during the time and location specified.

Lecture

Lecture

Self Instructional Manual

Video Tape

Slide Series

VI. Post-assessment

A written test will be administered after the student has satisfied the criteria evaluation stated in the objective for this mini module. A score of 100% is required before the next mini module may be be attempted.

VII. Remediation

Students not satisfying the criteria for the objective or obtaining 100% on the post assessment are required to review their work via one of the delivery systems and consult the instructor regarding make up assessments and/or satisfying the criteria for a continuous tone negative.

VIII. Time Requirement

The following times for each process are suggested guidelines only; some students may progress faster and others not as fast.

Portrait photograph:		five minutes
Negative Processing:		eight minutes
Negative Drying	:	twenty minutes
Total Time	:	thirty-three minutes

IX. Grade Options

Students wishing to receive letter grades of either B or A must satisfy the conditions and criteria for the following objectives.

B The student is to use the adjustable camera as a copy camera to photograph a continuous tone or line copy original image. The student will set up the adjustable camera for copy work, positioning the photofloods at a forty five degree angle, and equidistant form the copy, place the gray scale in a dead area on the copy, using the light meter, and process the negative with available facilities and equipment. The continuous tone negative will be evaluated within the following criteria:

1. Sharpness of the image.
2. Density range of $1.50^{\pm}.10$.
3. Contrast index of .65.
4. Proper use of photofloods to control unwanted light reflections.

A The student is to use the adjustable camera to photograph a still life photocomposition, familiar scene, or product. The student will set up the adjustable camera to photograph the composition using two photofloods

set to the proper light ratio, gray scale, light meter, back drop, and process the negative using the provided facilities and equipment. The continuous tone negative will be evaluated with the following criteria:

1. Sharpness of the image
2. Depth of field
3. Acceptable light ratio of 1:2, 1:3, or 1:4
4. Density range of $1.50 \pm .10$
5. Contrast Index of .65